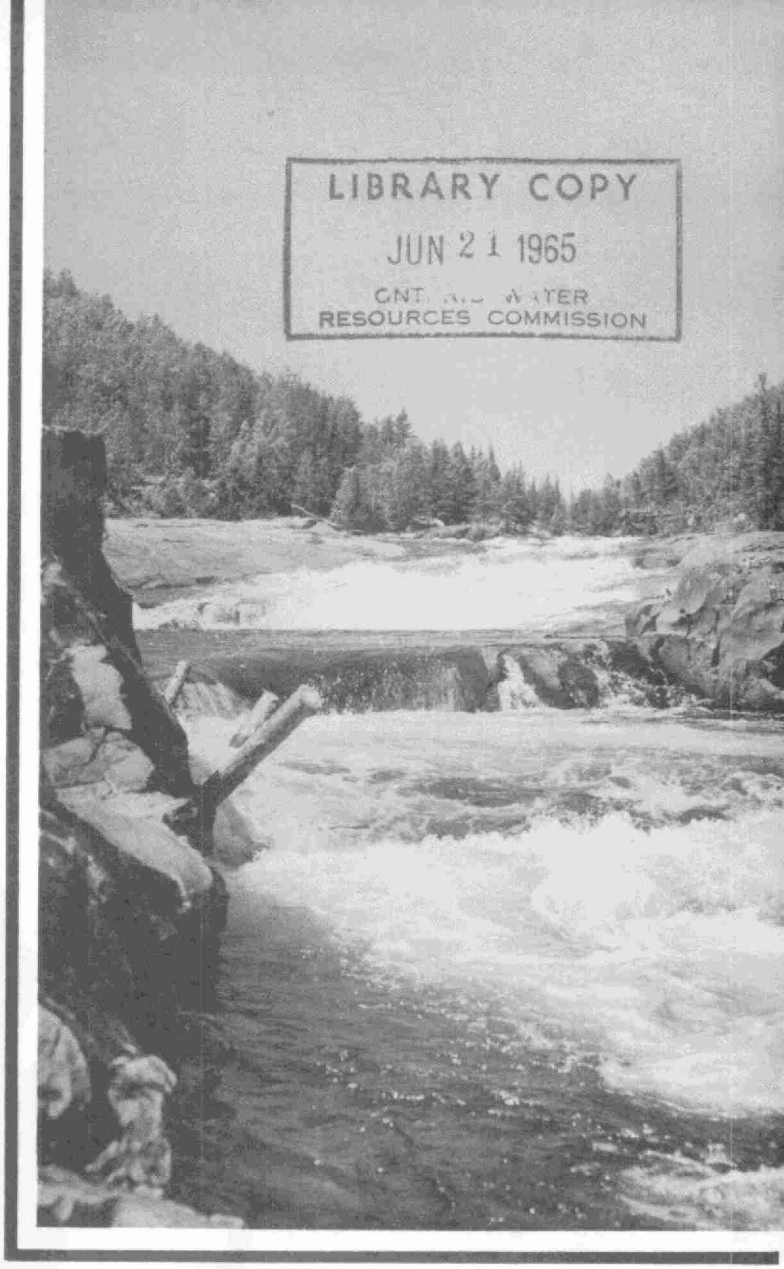
Lakeview

Water Pollution Control Plant



1963 Annual Report

Ontario Water Resources Commission

ONTARIO WATER RESOURCES COMMISSION

OFFICE OF THE GENERAL MANAGER

Members of the Lakeview Water Pollution
Control Plant
Local Advisory Committee.

Gentlemen:

I am pleased to submit, for your information, the 1963 Annual Operating Report of the Lakeview Water Pollution Control Plant, OWRC Project 59-S-43, which has been prepared by our Division of Plant Operations.

We are grateful for the kind cooperation which you and your staff have extended to our Operations staff throughout the year. We look forward to a continuing close association with you in our mutual endeavour to control pollution.

Yours very truly,

D. S. Caverly, P. Eng.,
General Manager

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General Manager

General Manager,

Ontario Water Resources Commission.

Dear Sir:

It is with pleasure that I present to you the Annual Report of the operation of the Lakeview Water Pollution Control Plant, OWRC Project No. 59-S-43 for 1963.

This report presents design data, outlines operating problems encountered and summarizes in tables, charts and graphs all significant flow and cost data.

Yours very truly,

B C Palmer

B. C. Palmer,

Director,

Division of Plant Operations.

foreword

This report is designed to present the highlights of the operation of these works during 1963. Trends in flows and other operating data can be extremely useful in the development of necessary long range enlargement and improvement programs.

In addition to the activities reported herein, much unrecorded effort has contributed to the success of this operation. The municipalities, through representatives on the Local Advisory Committee, have given valuable assistance in reviewing salary schedules, detailed operating budgets, personnel problems, flow patterns, and major maintenance problems.

The Division of Plant Operations has provided direction to the field staff in administrative procedures, quality control, maintenance schedules, equipment inspection and purchase supervision. A number of other Divisions of the Commission have been of service. The Division of Construction has offered helpful advice on equipment selection and renovation problems. The Division of Sanitary Engineering has maintained, through its District Engineering staff, a keen interest in the operation and has made a number of constructive recommendations. Its operator training courses have been very helpful. The Division of Finance has processed many payrolls, purchase orders and invoices dealing directly with this project. The Commission Personnel Director has been most helpful in the selection of new staff.

The excellent cooperation of all of these groups is gratefully acknowledged.

B. C. Palmer

B. C. Palmer,
Director,
Division of Plant Operations

DIVISION OF PLANT OPERATIONS

contents

Mr. C. W. Perry
Assistant Director
Mr. A. C. Beattie
Regional Supervisor
Mr. A. Clark
Operations Engineer

LAKEVIEW WATER POLLUTION CONTROL PLANT

OPERATED FOR

THE TOWNSHIP OF TORONTO

AND THE

MUNICIPALITY OF METROPOLITAN TORONTO

BY

THE ONTARIO WATER RESOURCES COMMISSION

CHAIRMAN

A. M. Snider

COMMISSIONERS:

W. D. Conklin, Q. C.
J. H. H. Root, M. P. P.
J. A. Vance, LL. D., P. Eng.
A. A. Wishart, Q. C., M. P. P.

GENERAL MANAGER

D. S. Caverly

ASSISTANT GENERAL MANAGERS

G. M. Galimbert
L. E. Owers

COMMISSION SECRETARY

W. S. MacDonnell

1956 to 1963 History

In 1956, the Township of Toronto and the Ontario Water Resources Commission initiated plans for the construction of a modern water pollution control plant. The firm of Gore and Storrie, Toronto Ontario, was engaged to prepare plans and specifications for the project.

In April 1957, Metropolitan Toronto expressed interest in sharing the cost with the Township of Toronto in the construction of a joint water pollution control plant, the costs to be shared 70 percent by Metropolitan Toronto and 30 percent by the Township of Toronto.

APPROVAL

On June 6, 1960, the municipalities signed an agreement with the Ontario Water Resources Commission to finance, construct, and operate a water pollution control plant.

CONSTRUCTION

Schwenger Construction Co. Ltd. - Burlington, Ontario was awarded the contract and the project was officially opened on November 24, 1961.

TOTAL COST

The total cost of the project was $1,883,644.00.

Project Staff

K. Stratton
Plant Superintendent

Mr. K. Stratton, Plant Superintendent, joined the Commission in May 1958 as an operator at the Stratford Water Pollution Control Plant. He later became Chief Operator and in October 1961 was transferred to the Toronto-Lakeview plant and promoted to Plant Superintendent.

Other members of the Toronto-Lakeview staff and their starting dates are:

F. Mines, Plant Mechanic	November 1961
A. Srebotnjak, Operator	November 1961
S. McKnight, Operator	November 1961
F. A. Press, Groundskeeper and Janitor	November 1961
H. Hamilton, Operator	March 1963
N. Cation, Operator	July 1963

Description of Project

INFLUENT WORKS

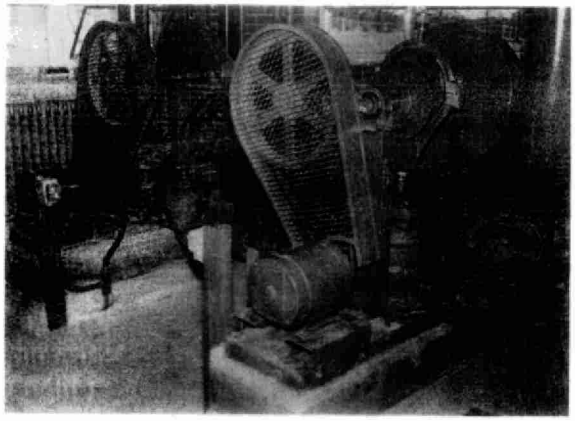
The waste water enters the plant through a 48 inch diameter sewer, passing into the influent chamber. The chamber is equipped with a bar screen to remove large objects from the sewage. The flow then discharges to the aerated grit chamber where the velocity of flow is reduced sufficiently to allow grit and detritus material, which may damage plant machinery, to settle out. The air introduced in the chamber produces a roll which allows grit to settle out, while keeping the organic material in suspension. A clam shell bucket hoist removes the settled grit.

From the grit chamber, the flow passes through a comminuting device which screens and shreds the larger particles to a size suitable for handling in the treatment units. From this point, the flow is discharged to the primary tanks.

PRIMARY SEDIMENTATION

The two rectangular tanks are designed to provide an adequate detention period to allow the heavier solids to settle out, and for removal of surface scum and grease.

The tanks are divided into two sections and equipped with longitudinal sludge collectors which serve as skimming mechanisms for removal of surface material and for transferring the settled sludge to hoppers located at the end of the tanks. The sludge hoppers are equipped with cross collector mechanisms which draw the sludge to a central point. The sludge and the surface material is drawn off and pumped to the primary digester.

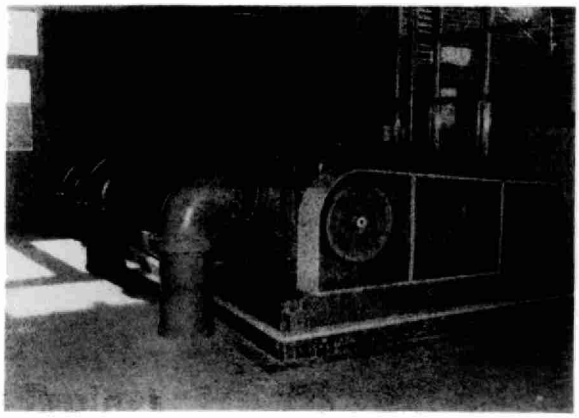


The primary tanks are designed to provide a detention period, sufficient to allow removal of approximately 30-35% of the heavy organic material.

The settled waste water flows over the effluent weirs and discharges into the aeration tanks.

AERATION

The flow upon entering these two, three pass, aeration tanks undergoes another detention period which provides the biological environment required to remove the finely divided, suspended and dissolved organic materials remaining in the flow.



The settled sludge (activated sludge), from the final settling tanks, is recirculated back to the aeration tanks, and mixes with the incoming effluent from the primary tanks. This mixed liquid is then aerated by air, which is supplied from compressors. The air supplied provides the oxygen requirements of the biological communities of aerobic micro-organisms (mixed liquor sludge floc) and also produces a roll which prevents settling in the tanks. The

activated sludge which is returned acts as the vehicle for the bacteria which in turn oxidizes the organic material contained in the sewage.

The mixed liquor then passes into the final settling tanks where the activated sludge is settled out.

FINAL SEDIMENTATION

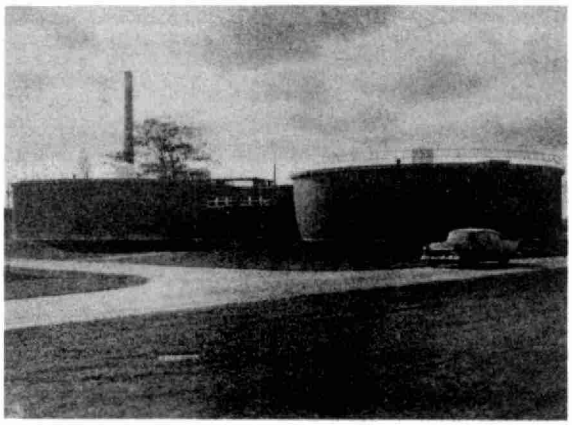
The three rectangular final sedimentation tanks provide a detention period to allow remaining activated sludge solids to settle out. It is the activated sludge, settling out in these tanks, that is returned to the aeration tanks to provide the continuous environment for the

maintenance of the floc in the aeration section.

The final sedimentation tanks are equipped with two longitudinal sludge collectors which transfer the settled sludge to the hopper located at the end of the tank. Cross collectors transfer the sludge from the hopper to a central point from where pumps transfer it back to the aeration tanks or to waste. After final settling, the effluent flows through a Parshall flume which measures the flow leaving the plant and then to the chlorinating manhole.

DIGESTION

Sludge digestion in this plant is performed in two stages called primary and secondary digestion.



The sludge from the primary tanks is pumped, with excess activated sludge, to the primary digester. In the absence of air, and in a regulated temperature of 90 degrees Fahrenheit, the decomposing or digestion process begins. Constant agitation within the tank ensures overall treatment.

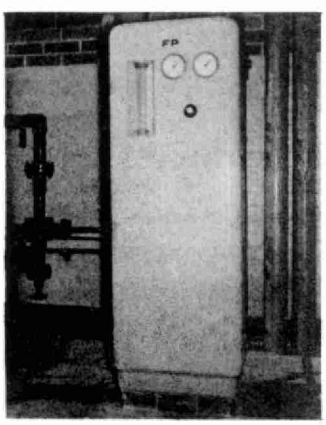
The raw sludge is broken down by anaerobic bacterial action and, when thoroughly digested, is a thick, black odourless liquid.

The secondary digester receives the digested material from the primary and completes the process. The secondary digester is not agitated, but is allowed to be quiescent. The supernatant is decanted and returned to the treatment process.

Sludge gas (principally methane), formed during the process, is used as a fuel for the heat exchangers and boiler, supplying heat to the digesters and buildings. The standby fuel is oil.

CHLORINATION

The chlorinator is capable of injecting up to 2,000 pounds per day of chlorine into the final effluent to reduce the bacteria count to acceptable limits.



Design– Data

GENERAL

Type of Plant - Activated sludge.

Design Population - 50,000 persons.

Design Plant Flow - 5 MGD.

Per Capita Flow - 100 gallons per day.

Five Day BOD -

Raw Sewage	-	225 PPM
Removal	-	90%

Suspendeds Solids -

Raw Sewage	-	250 PPM
Removal	-	90%

GRIT CHAMBER

14 ft. x 15 ft. 5 in. x 11 ft. deep, with a volume of 2,375 cubic feet, (14,800 gallons), and a design flow detention period of 4.26 minutes.

PRIMARY SEDIMENTATION TANKS

The two tanks, each 87 ft. x 32 ft. x 12 ft. deep, have a combined volume of 66,900 cubic feet, (417,000 gallons). Design detention is 2.0 hours. The surface settling rate is 900 gallons per square foot of tank per day, and the weir overflow rate is 13,000 gallons per lineal foot of weir per day. The longitudinal collector speed is 2.0 feet per minute and the cross collector 4.0 feet per minute.

AERATION

The two rectangular three pass tanks are each 144 ft. x 21 ft. x 14.3 ft. deep, with a combined volume of 250,000 cubic feet, (1,650,000 gallons). The aeration period at design flow is 7.9 hours, and with 25% return activated sludge is 6 hours. The air supply is 1.1 cubic feet per gallon.

FINAL SEDIMENTATION TANK

The three rectangular tanks are 87 ft. x 32 ft. x 12 ft. deep, with a combined volume of 100,000 cubic feet (624,000 gallons). The design detention period is 3 hours. The surface settling rate is 600 gallons per square foot of tank per day, and the weir overflow rate is 7,000 gallons per lineal foot of weir per day. The speed of the longitudinal collectors is 1.0 ft. per minute and the three cross collectors 2.0 ft. per minute.

CHLORINATION

The effluent sewer, approximately 2,000 feet long, acts as a chlorine contact chamber and provides a detention period of 50 minutes.

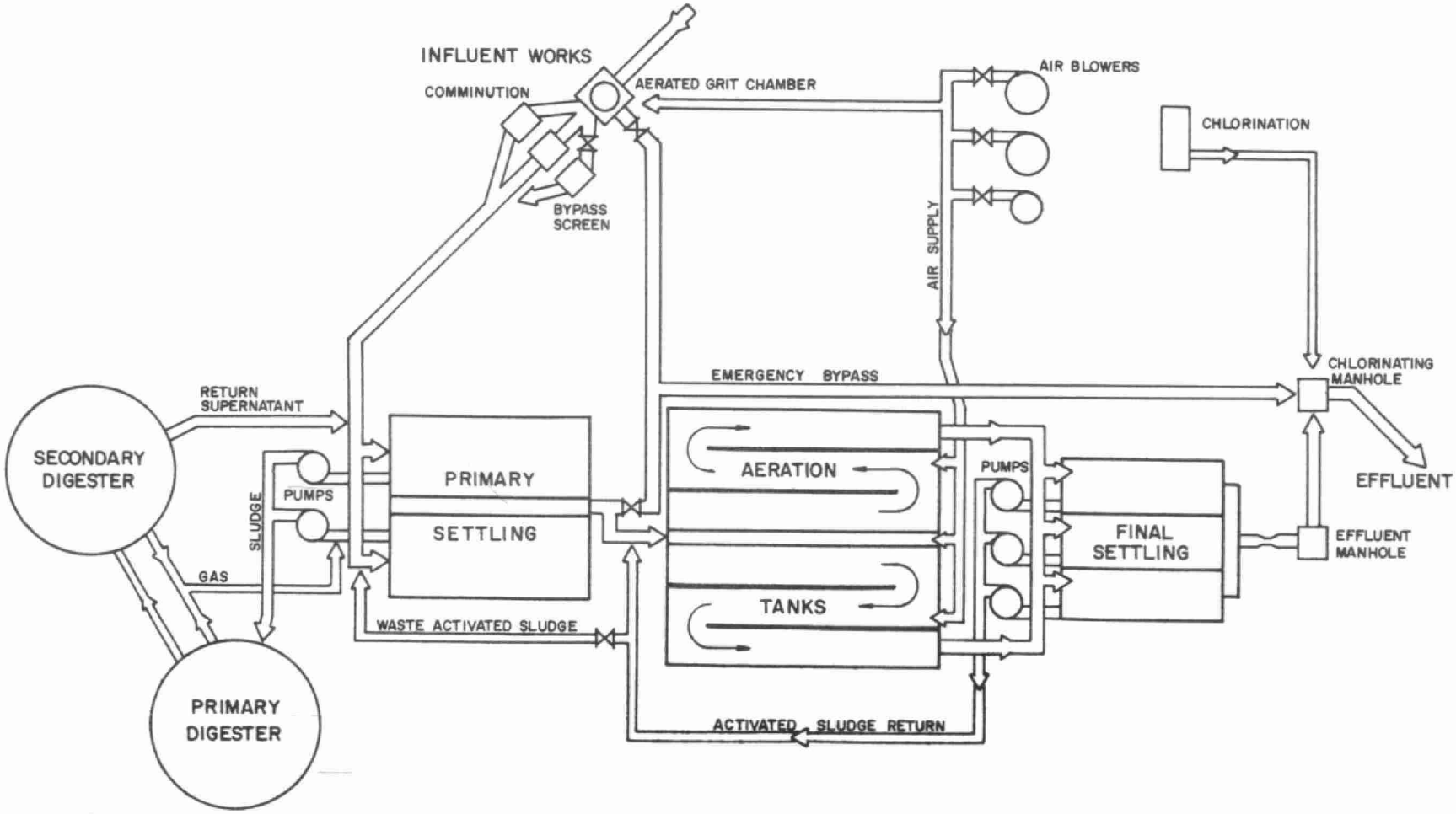
DIGESTION

Two tanks - concrete roofs - 65 feet in diameter with a combined volume of 164,500 cubic feet. Their capacity is 3.28 cubic feet per capita, and loading is 2.3 lbs. of solids per cubic foot of tank per month.

EQUIPMENT

The two large air blowers each have a rated capacity of 3,900 cubic feet of air per minute and the small blower, 1,700 cubic feet, operating against a gauge pressure of 6.5 psi, with an overall total capacity of 11,500,000 cubic feet of air per day.

Located in the raw sludge pumping station are two raw sludge pumps, 50 gpm at 70 ft. TDH each, and a scum pump, 80 gpm at 70 ft. TDH. Located in the return sludge pumping station are four activated sludge return pumps, 600 gpm each, and a scum pump 50 gpm. Located in the digester control building are two sludge transfer pumps, 150 gpm each, and two sludge recirculating pumps 120 gpm each.



LAKEVIEW WPCP FLOW CHART

PROCESS DATA

FLOW CHART

MONTH	METROPOLITAN TORONTO MG	TORONTO TOWNSHIP MG	PORT CREDIT MG	TOTAL PLANT MG
JANUARY	14.83	45.52	11.18	71.53
FEBRUARY	13.70	38.00	10.41	62.11
MARCH	20.08	56.02	15.18	91.28
APRIL	26.47	55.30	15.98	97.75
MAY	40.73	56.30	20.82	117.84
JUNE	40.82	50.65	13.05	104.52
JULY	43.89	49.55	12.99	106.43
AUGUST	48.52	53.46	12.64	114.62
SEPTEMBER	40.14	55.14	13.81	109.09
OCTOBER	39.06	58.34	11.94	109.34
NOVEMBER	39.01	60.99	11.84	111.85
DECEMBER	37.42	63.99	11.57	112.99
TOTAL	404.67	643.27	161.41	1209.35
PERCENT OF TOTAL YEARLY FLOW	33.4	53.2	13.4	100.0

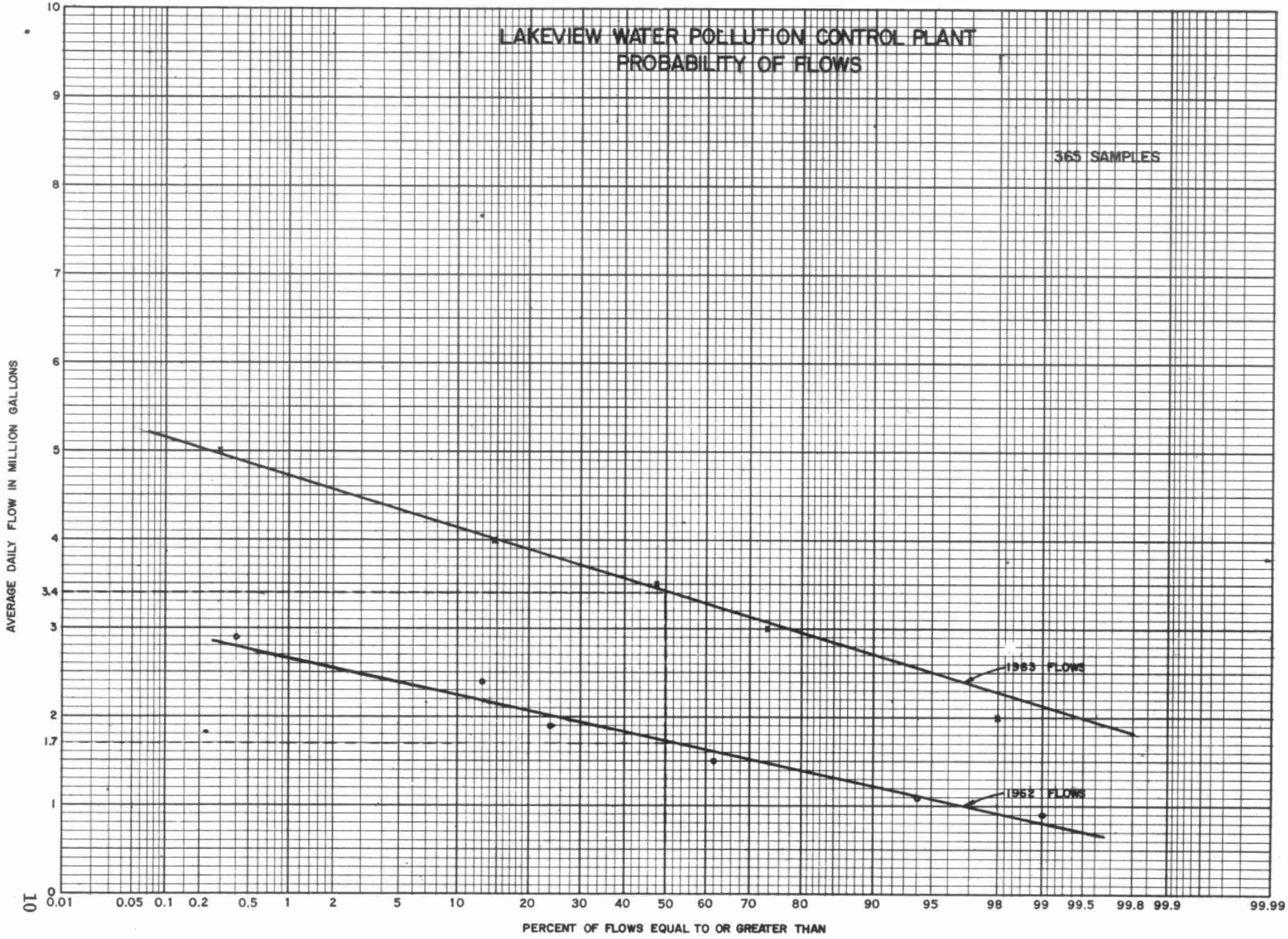
COMMENTS

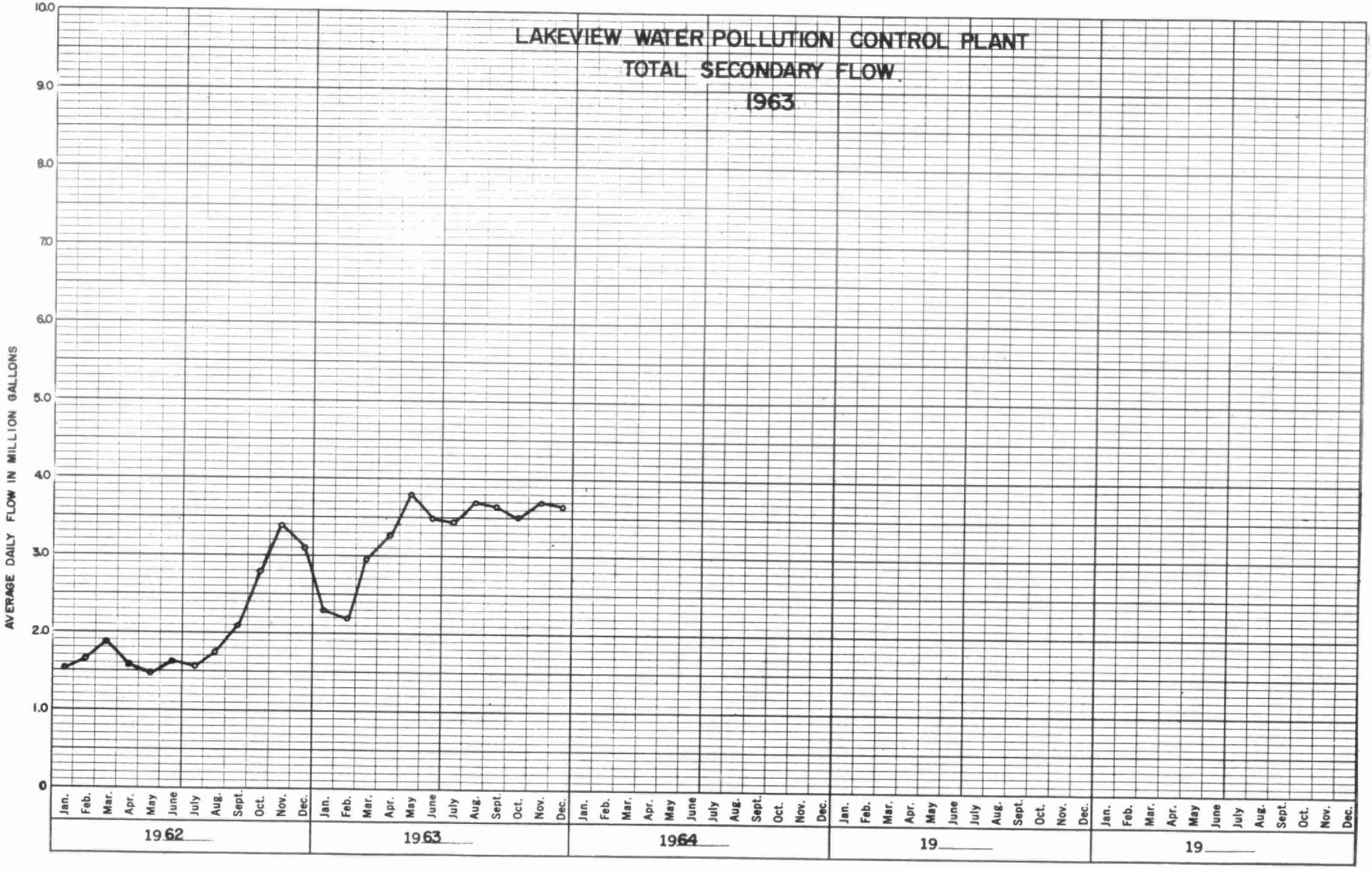
During 1963 a total of 1209.35 million gallons of sewage were treated at the Lakeview plant. This represents an average daily flow of 3.4 million gallons per day or 68 percent of the design capacity of the plant.

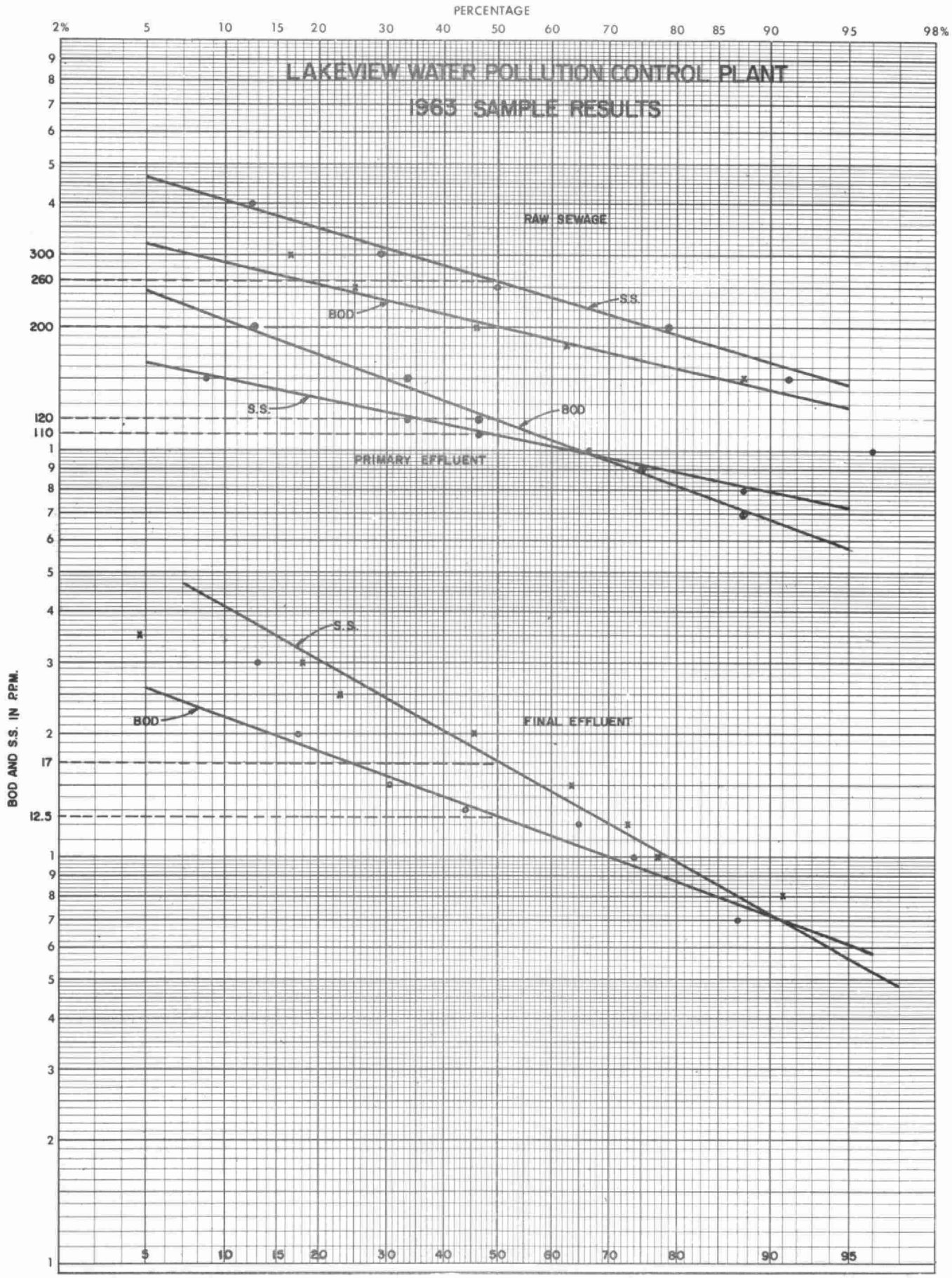
The Town of Port Credit contributed a total of 161.41 million gallons during the year which averaged 0.44 million gallons per day.

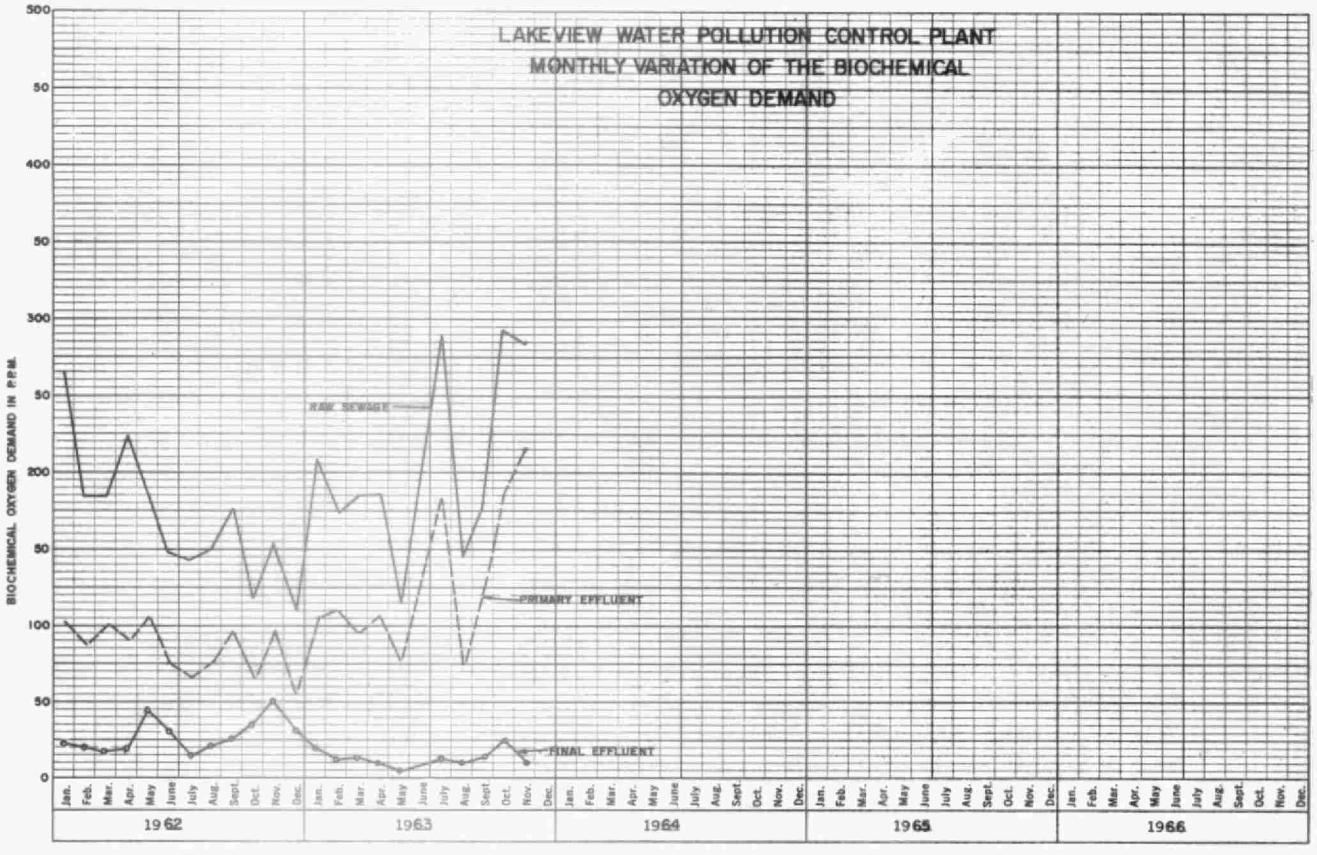
The Township of Toronto contributed a total of 643.27 million gallons during the year which averaged 1.76 million gallons per day.

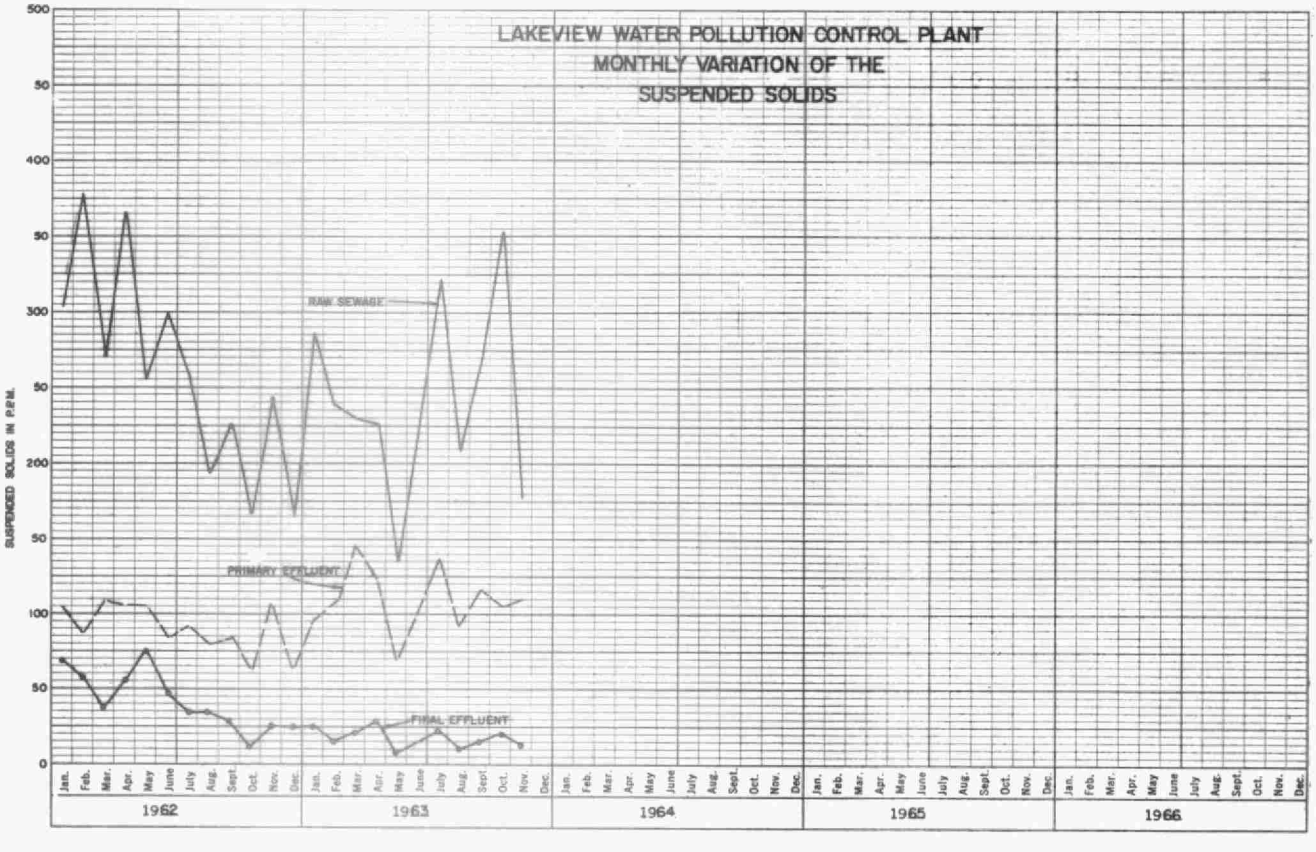
Metropolitan Toronto contributed a total of 404.67 million gallons during the year which averaged 1.11 million gallons per day. The flow from Metropolitan increased approximately 0.5 million gallons a day in May.


LAKEVIEW WATER POLLUTION CONTROL PLANT
PROBABILITY OF FLOWS
365 SAMPLES
1963 FLOWS
1962 FLOWS
AVERAGE DAILY FLOW IN MILLION GALLONS
PERCENT OF FLOWS EQUAL TO OR GREATER THAN
10
9
8
7
6
5
4
3.4
3
2
1.7
1
0
0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99.5
99.8
99.9
99.99


LAKEVIEW WATER POLLUTION CONTROL PLANT
TOTAL SECONDARY FLOW
1963
AVERAGE DAILY FLOW IN MILLION GALLONS
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1962
1963
1964
19
19


LAKEVIEW WATER POLLUTION CONTROL PLANT
1963 SAMPLE RESULTS
PERCENTAGE
2%
5
10
15
20
30
40
50
60
70
80
85
90
95
98%
RAW SEWAGE
S.S.
BOD
PRIMARY EFFLUENT
FINAL EFFLUENT
BOD AND S.S. IN P.P.M.
300
260
200
120
110
17
12.5
PERCENT OF SAMPLES EQUAL TO OR GREATER THAN


LAKEVIEW WATER POLLUTION CONTROL PLANT
MONTHLY VARIATION OF THE BIOCHEMICAL OXYGEN DEMAND
BIOCHEMICAL OXYGEN DEMAND IN P.P.M.
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
1962
1963
1964
1965
1966


LAKEVIEW WATER POLLUTION CONTROL PLANT
MONTHLY VARIATION OF THE SUSPENDED SOLIDS
SUSPENDED SOLIDS IN P.P.M.
RAW SEWAGE
PRIMARY EFFLUENT
FINAL EFFLUENT
1962
1963
1964
1965
1966

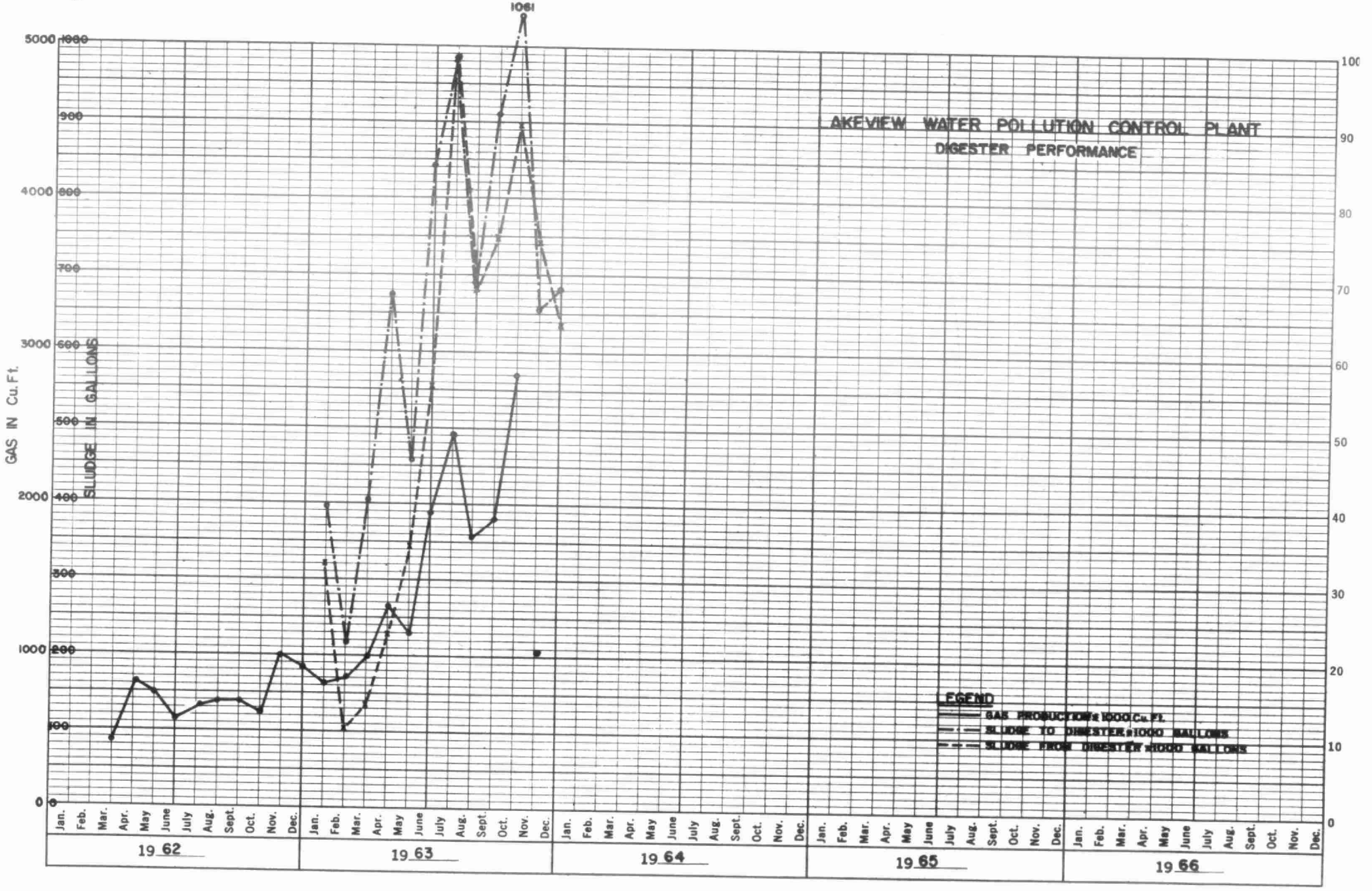
GRIT B.O.D. AND S.S. REMOVAL

MONTH	B.O.D.				S.S.				GRIT REMOVAL CU. FT.
	INFL. P.P.M.	EFFL. P.P.M.	% REDUCT	TONS REMOVED	INFL. P.P.M.	EFFL. P.P.M.	% REDUCT	TONS REMOVED	
JANUARY	208	19	91.0	67.6	284	26	91.0	92.2	106
FEBRUARY	175	12	93.0	50.6	240	15	93.5	69.9	44
MARCH	185	12	93.5	79.0	230	20	91.5	95.8	37
APRIL	185	10	94.5	85.5	225	27	88.0	96.8	40
MAY	114	6	94.5	63.8	134	7	94.5	74.9	80
JUNE*									55
JULY	291	12	96.0	148.5	322	23	93.0	159.0	94
AUGUST	144	10	93.0	77.0	210	9	95.5	115.0	80
SEPTEMBER	178	16	91.0	88.2	271	14	95.0	140.0	94
OCTOBER	292	24	91.5	143.0	352	19	94.5	177.3	44
NOVEMBER	285	10	96.5	154.0	177	13	92.5	91.7	29
DEC. *									34
TOTAL									737
AVERAGE	206	13	93.5	95.7	244	17	93.0	111.3	61

* No samples taken.

COMMENTS

The Lakeview Water Pollution Control Plant operated efficiently during 1963. The biochemical oxygen demand of the final effluent averaged below the OWRC objective of 15 ppm, while the suspended solids exceeded the objective very slightly. The removal efficiency of 93.5 percent for BOD and 93.0 percent for S.S. was quite satisfactory.


1061
LAKEVIEW WATER POLLUTION CONTROL PLANT
DIGESTER PERFORMANCE
GAS IN Cu. Ft.
SLUDGE IN GALLONS
5000
4000
3000
2000
1000
0
1000
900
800
700
600
500
400
300
200
100
0
100
90
80
70
60
50
40
30
20
10
0
LEGEND
GAS PRODUCTION x 1000 Cu. Ft.
SLUDGE TO DIGESTER x 1000 GALLONS
SLUDGE FROM DIGESTER x 1000 GALLONS
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1962
1963
1964
1965
1966

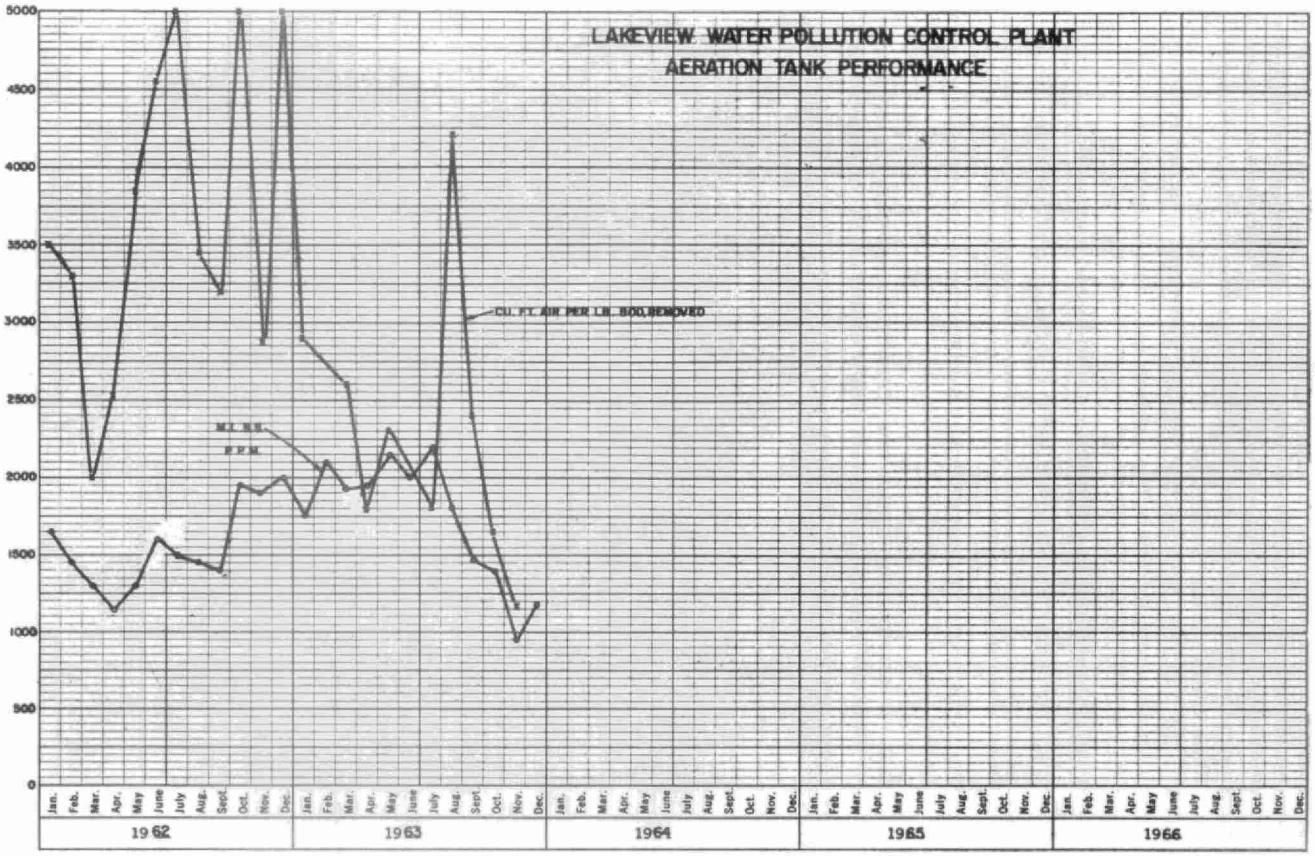
DIGESTER OPERATION

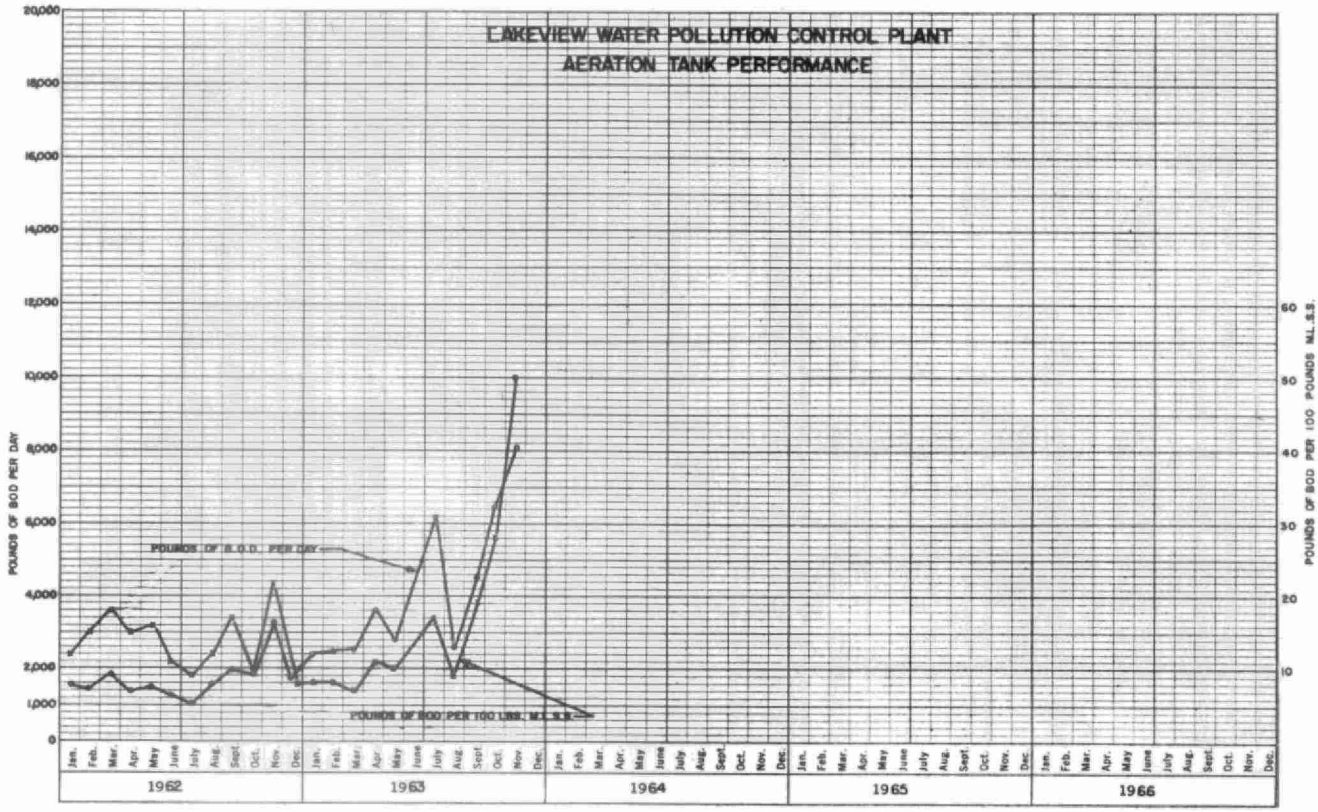
MONTH	SLUDGE TO DIGESTERS			PERCENT VOLATILE MATTER IN DIGESTED SLUDGE	GAS PRODUCED THOUSAND CU. FT.	SLUDGE FROM DIGESTER THOUSAND GALLONS
	1000's GALS.	% SOLIDS	% VOLATILE MATTER			
JANUARY	396,225	6.2	70.5	53.7	820	320.6
FEBRUARY	219,464	4.8	72.3	50.1	850	104.8
MARCH	403,399	5.6	66.5	56.5	994	136.8
APRIL	673,200	5.8	67.1	58.3	1328	229.6
MAY	459,554	5.7	65.0	53.1	1133	342.4
JUNE	842,231	4.9	67.8	54.9	1932	555.4
JULY	985.027	4.5	73.0	60.7	2467	985.8
AUGUST	696,740	4.4	67.0	58.6	1752	681.0
SEPT.	911,031	4.6	66.5	60.0	1899	748.8
OCTOBER	1061,814	3.8	69.5	65.2	2827	897.9
NOVEMBER	656,221	5.5	80.0	65.8		741.6
DECEMBER	682,881	4.6	82.0	68.3		636.8
TOTAL	7987,787				16002	6381.5
AVERAGE	665,648	5.0	70.6	58.8	1600	531.8

COMMENTS

A total of 7,988,000 gallons of raw sludge at an average concentration of 5.0 percent was pumped to the digesters and 6,382,000 gallons of digested sludge were removed. This is a reduction in volume of approximately 20 percent. The percent volatile matter was reduced 42 percent from 70.6 to 58.8.

Gas production was 6.8 cubic feet per pound of volatile matter added. This is considered normal gas production.


LAKEVIEW WATER POLLUTION CONTROL PLANT
AERATION TANK PERFORMANCE
CU. FT. AIR PER LB. BOD REMOVED
M.L.S.S. P.P.M.
5000
4500
4000
3500
3000
2500
2000
1500
1000
500
0
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1962
1963
1964
1965
1966


LAKEVIEW WATER POLLUTION CONTROL PLANT
AERATION TANK PERFORMANCE
POUNDS OF B.O.D. PER DAY
POUNDS OF BOD PER 100 LBS. M.L.S.S.
POUNDS OF BOD PER DAY
POUNDS OF BOD PER 100 POUNDS M.L.S.S.
20,000
18,000
16,000
14,000
12,000
10,000
8,000
6,000
4,000
2,000
1,000
0
60
50
40
30
20
10
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1962
1963
1964
1965
1966

AERATION SECTION

MONTH	PRIMARY EFFLUENT BOD PPM	M. L. S. S. PPM	POUNDS BOD PER 100 LBS. M. L. S. S.	CU. FT. AIR PER LB. BOD REMOVED
JANUARY	106	1755	8	2885
FEBRUARY	111	2125	8	
MARCH	96	1922	7	2604
APRIL	106	1941	11	1774
MAY	78	2148	10	2304
JUNE		1983		
JULY	183	2208	17	1819
AUGUST	73	1792	9	4209
SEPT.	124	1470	19	2396
OCTOBER	185	1410	28	1651
NOVEMBER	215	945	52	1170
DECEMBER		1170		
AVERAGE	128	1739	17	2312

COMMENTS

During 1963 the aeration section used excessive amounts of air in an effort to adequately nitrify the suspended solids in the final effluent. After many different approaches were attempted, one half of the aeration tank capacity was removed from service. The higher loading to the remaining section cut the air consumption, provided better dissolved oxygen control and did not reduce final effluent quality.

This change was also made in anticipation of increased loading during the spring of 1964 which will double the BOD load to the complete aeration section of the plant.

INDUSTRIAL WASTES

The Lakeview Water Pollution Control Plant receives a significant industrial waste load. Sample results for industrial wastes in the raw sewage are shown in Table No. I.

The industrial wastes are especially noticeable in the raw sewage as it enters the influent works and primary settling tanks. A strong paint or solvent smell is frequently noticed in this area. Frequent laboratory analyses have failed to identify the substances which cause this smell.

A number of operating difficulties at the plant are suspected to be caused by these industrial wastes. The difficulties are listed as follows:

1. Poor settling and light sludge in the primary settling tanks.

2. Excessive air consumption in the aeration tanks.

3. Very little nitrification of the plant effluent during periods of high air consumption.

4. Poor settling characteristics of the activated sludge in the final tanks.

Emulsifying agents used by some industries such as Northern Industrial Laundries are felt to contribute to the poor settling characteristics of the sludge and the carry over of greases and oils to the aeration system.

It is felt that the aeration process is being inhibited by greases and oils plus the addition of certain heavy metals as listed in Table No. I.

It is known that a copper concentration of 1.2 mg per litre causes a significant deterioration in final effluent quality. Although the concentrations of heavy metals to the plant is less than those dosages which are known to significantly deteriorate the final effluent quality, there may be periods where certain combinations of metals cause inhibition of the aerobic treatment.

Inhibition of nitrification is regarded as an important effect of metal toxicity. A plant so affected would discharge all the influent nitrogen in excess of that needed for synthesis, predominately in the form of ammonia. The following table illustrates the results at the Lakeview plant.

INDUSTRIAL WASTES IN RAW SEWAGE

TABLE NO. I

DATE	FREE AMMONIA	TOTAL KJELDAHL	COPPER AS Cu.	LEAD AS Pb.	CADMIUM AS Cd.	ZINC AS Zn.	COBALT AS Co.	NICKEL AS Ni.	PHENOLS IN p.p.b.	BISMUTH AS Bi.	CHROMIUM AS Cr.	TOTAL OF Cu, Ni, Zn, Cr.
Jan. 2	25	45										
Jan. 11	20	30	1.14	3.1	0.0	0.0	0.0	0.0				1.14
Jan. 14	21	41	0.40	1.25	0.0	0.0	0.0	0.0				0.40
Jan. 15	18	41	0.75	0.65	0.0	0.0	0.0	0.0				0.75
Jan. 29	27	45	3.15	0.65	0.30	1.85	0.0	0.0				5.00
Feb. 7	21	28	0.50	0.45	0.50	0.80	0.0	0.0	60			1.30
Feb. 15	20	31	0.20	1.60	0.0	0.0	0.64	0.0	250	0.10		0.20
Mar. 14	20	31	0.30	0.68	0.6	0.0	0.11	0.35		0.15		0.65
Apr. 3	15	25	0.17	0.62	0.0	0.29	1.2	0.0	120	0.10		0.46
May 2	15	24	0.12	0.75	0.1	0.85	0.1	0.17	100	0.10		1.14
June 21	23	49							110			
July 4	20	41							100			
July 11	16	38							20			
July 17	16	21							60			
July 25	15	35	0.12	0.57	0.0	0.85	0.0	0.0		1.0		0.97
July 30	18	34	0.23	1.17	0.1	0.43	0.0	0.0	140	1.0		0.66
Aug. 22	18	25	0.38	0.21	0.0	0.35	0.1	0.0	100	1.0		0.73
Aug. 28	20	35	0.23	0.50	0.0	0.2	0.0	0.0		0.1	0.0	0.43
Sept. 3	20	28	0.16	0.55	0.0	1.0	0.0	0.0		1.0		
Sept. 27	20	45										
Oct. 3	20	54										
Dec. 30	29	58										
Average	20	37	.56	.91	.11	.42	.15	.04	106	.51	0.0	

NITROGEN VARIATION

DATE	RAW			FINAL			Percent Reduction of Ammonia
	Free Ammonia	Nitrite	Nitrate	Free Ammonia	Nitrite	Nitrate	
Jan. 2	25	0	0	31	0.2	0	0
11	20	0	0	16	0.1	0	20
14	21	0	0	25	0	0	0
15	18	0	0	20	0.1	0	0
29	27	0	0	24	0.1	0	11
Feb. 7	21	0.3	0	23	0.1	0	0
15	20	0.1	0	21	0.1	0	0
Mar. 14	20	0	0	15	0	0	25
Apr. 3	15	0	0	18	0.1	0.2	0
May 2	15	0	1.3	11	0.2	0.4	27
June 21	23	0	0.1	20	0	0	13
July 4	20	0	0	25	0.1	0	0
July 11	16	0	0	21	0.2	0	0
July 17	16	1.0	0	20	0.1	0	0
July 25	15	0	0	11	1.0	0.2	27
July 29	18	0	0	6	2.0	0.5	66
Aug. 22	18	0	0	4	0.6	6.3	78
Aug. 28	20	0	0	0.5	0.2	8.0	98
Sept. 3	20	0	0	0.1	0.6	10.0	99
Sept. 27	20	0	0	12	0.1	0	40
Oct. 3	20	0	0	6	0.5	4.0	70
Oct. 30	29	0.1	0	21	0	0	28
Average	20			16	.3	1.4	

CHLORINATION

MONTH	PLANT FLOW (MGD)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	71.53	2968	4.15
FEBRUARY	62.11	2588	4.17
MARCH	91.28	3338	3.66
APRIL	97.75	3248	3.32
MAY	117.84	3285	2.78
JUNE	104.52	3740	3.58
JULY	106.43	4947	4.65
AUGUST	114.62	8503	7.42
SEPTEMBER	109.09	5840	5.35
OCTOBER	109.34	5605	5.13
NOVEMBER	111.85	4970	4.44
DECEMBER	112.99	5340	4.73
TOTAL	1209.35	54372	
AVERAGE	100.078	4531	4.50

COMMENTS

During 1963 a total of 54,372 pounds of chlorine were used to provide a chlorine residual of 0.5 ppm after 15 minutes contact. The dosage required varied from 2.8 ppm to 7.4 ppm and averaged 4.5 ppm. Chlorine is purchased in ton cylinders.

1963

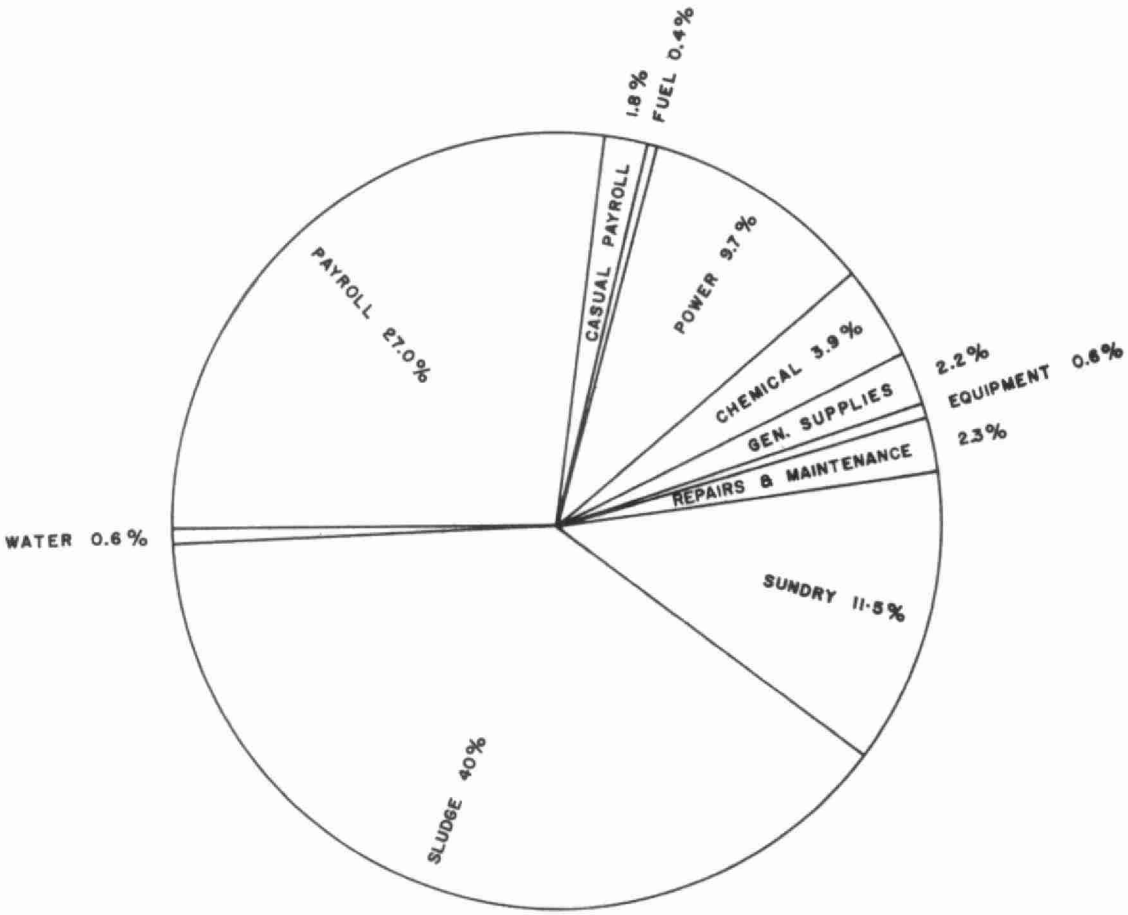
PLANT — **Total Operating Costs** — **MONTHLY**

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY	WATER
JAN	3838.61	2782.90			763.30		44.53	109.18	3.04	85.59	49.77
FEB	7584.77	2850.30		135.69	3.00	22.79	141.07		213.08	4218.84	
MARCH	7159.41	2387.33		213.72	4402.57	CREDIT (1364.06)	133.58		272.73	1071.87	41.67
APRIL	4870.13	2054.37		96.09	938.70	39.72	162.04	190.54	176.03	1177.54	35.10
MAY	6324.16	2262.73	54.72	2.30	229.51	1075.20	251.24		310.33	2076.93	61.20
JUNE	8623.80	2298.15	93.59		CREDIT (229.20)	CREDIT (1125.10)	283.64	46.76	290.35	6556.39	109.22
JULY	12941.71	3893.77	379.84	96.62	721.99	216.30	231.93	97.61	276.87	6986.91	39.87
AUG	7917.34	2599.38	227.70		269.90	1103.45	248.13	132.84	25.05	3265.48	45.41
SEPT	18307.82	2534.76	194.64		1269.22	87.62	464.34	28.74	219.77	13448.74	59.99
OCT	15493.31	2307.34	231.00		1475.35	3213.99	173.51	61.42	342.29	7688.41	
NOV	12038.84	2337.69	277.57	7.88	1374.28	5.72	212.80	122.20	288.17	7382.38	30.15
DEC	12927.45	3523.77	704.02		275.39	1297.80	252.49		261.32	6491.70	120.96
TOTAL	118027.35	31832.49	2163.08	552.30	11494.01	4573.43	2599.30	789.29	2679.03	60751.08	593.34

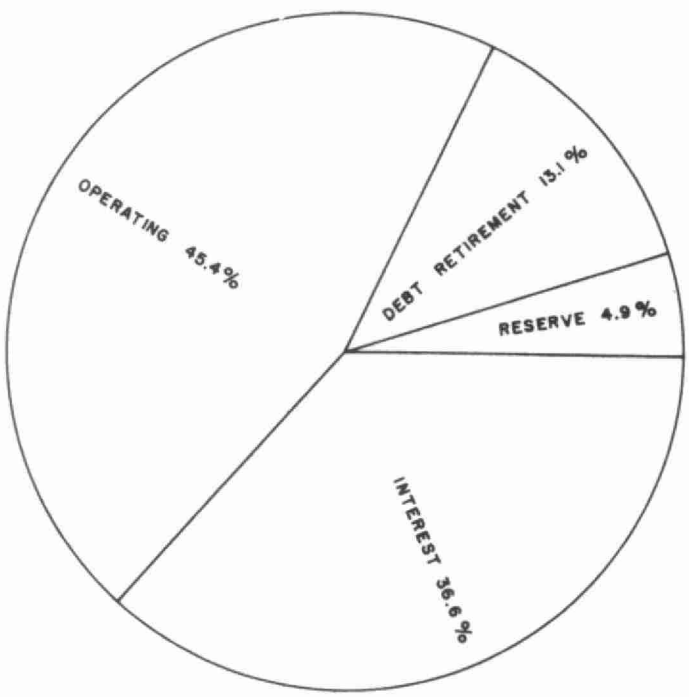
PLANT — **YEARLY**

YEAR	M.G. TREATED	TOTAL COST	COST PER MILLION GALLONS
1961			
1962	740.9	$ 73998	$99.87
1963	1209.4	$118027.00	$98.00

1963 OPERATING COSTS



TOTAL ANNUAL COST



SUMMARY

This report has given in detail the significant data on the operation of the various treatment units at the Lakeview Water Pollution Control Plant.

With an average daily flow of 3.4 million gallons in 1963, the plant was still below its full treatment capacity of 5.0 million gallons. The average daily flow has doubled from an average of 1.7 million gallons in 1962. During 1964, it is expected that the flow rate will increase from 3.4 MGD to 8.0 MGD.

During 1963, the final effluent quality was generally satisfactory in spite of the many difficulties being encountered with industrial wastes. Modifications in operation resulted in the air supply being adequate for the pollution load and industrial waste load being received.

Sludge hauling costs became quite significant during 1963. Approximately 40 percent of the annual operating cost was due to sludge hauling. This expenditure is due to the large quantity of sludge which was hauled (6,381,500 gallons) and to the increasing difficulty being encountered by the sludge hauling contractor in finding suitable disposal sites in the Metropolitan Toronto area. Sludge haulers in general are being forced to drive longer and longer distances to disposal sites which meet the requirements of local authorities.

As the plant gets older, maintenance of plant equipment and the pumping stations for the Township of Toronto and the Town of Port Credit will require more attention. OWRC head office technicians inspected and reported on the mechanical and electrical maintenance being routinely performed by the plant staff. The reports indicated a high degree of competence.

Under constant supervision by head office engineers, the plant staff has operated and maintained a clean, attractive and efficient plant for the Township of Toronto and the Municipality of Metropolitan Toronto.

Total 1963 Costs

The total cost to the municipality during 1963 was as follows:

Operating	$ 118,979.66
Debt Retirement	$ 34,431.00
Reserve	$ 12,901.00
Interest	$ 95,695.32
TOTAL	$ 262,006.98

Note: The amount in the Reserve Account as of December 31st, 1963 was $29,420.54.

Division of Plant Operations

ONTARIO WATER RESOURCES COMMISSION
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